



**education**

Department:  
Education  
PROVINCE OF KWAZULU-NATAL

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 11**

**LIFE SCIENCES**

**COMMON TEST**

**JUNE 2019**

**MARKS: 150**

**TIME: 2½ hours**

**This question paper consists of 17 pages.**

**INSTRUCTIONS AND INFORMATION**

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.

**SECTION A****QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The significance of the folded nature of the lining of the small intestine in the human digestive system is to ...

- A increases digestion.
- B increases secretions.
- C increases surface area for absorption.
- D decreases surface area for assimilation.

1.1.2 Grade 11 learners designed an experiment to investigate whether oxygen is used up during respiration of seeds.

Which of the following increases validity of their results?

- A Use more respiring seeds in sample
- B Use seeds from the same plant
- C Repeat investigation and observe if they get the same results
- D Expose seeds to light

1.1.3 The generation that is dominant in flowering plants is ...

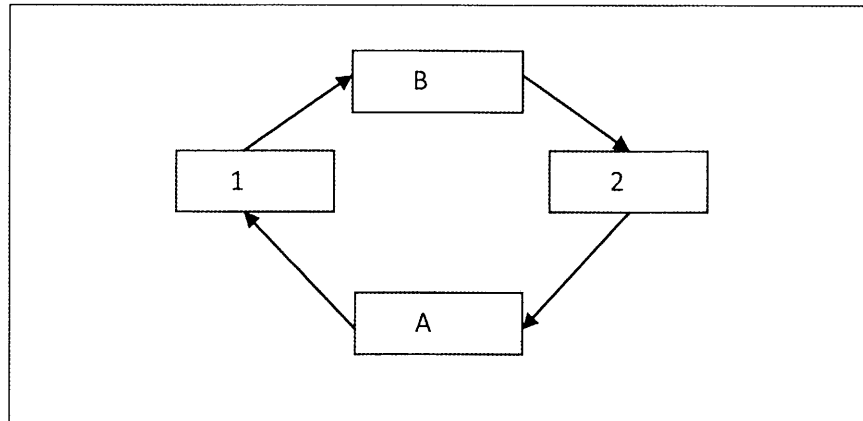
- A spores
- B gametophyte
- C sporophyte
- D gametes

1.1.4 In an experiment the enzyme carbohydrases was exposed to a temperature above optimum.

State the effect of this increased temperature on the enzyme activity.

- A Enzymes become inactive
- B Enzymes function better
- C Enzymes denature
- D Temperature increase has no effect on enzyme activity

**QUESTION 1.1.5** is based on the diagram below.



1.1.5 If **A** is carbon dioxide and **B** is oxygen, then process **1** and **2** are respectively ...

- A cellular respiration and photosynthesis
- B anaerobic respiration and fermentation
- C fermentation and photosynthesis
- D photosynthesis and cellular respiration

1.1.6 The following processes occur during human nutrition

- (i) Digestion
- (ii) Egestion
- (iii) Absorption
- (iv) Ingestion

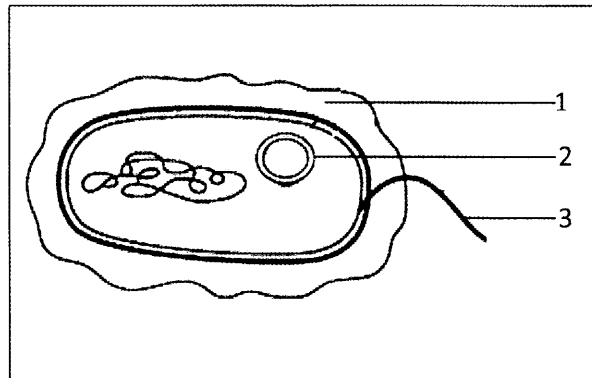
Re-arrange the processes in their correct order.

- A (ii), (i), (iv) and (iii)
- B (iv), (i), (iii) and (ii)
- C (iii), (ii), (iv) and (i)
- D (ii), (iii), (iv) and (ii)

1.1.7 The following organism belongs to the phylum Platyhelminthes:

- A Round worm
- B Flatworm
- C Ring worm
- D Segmented worm

1.1.8 The diagram below represents an organism that you studied.



Which of the following represents parts 1, 2 and 3 respectively?

- A Plasmid, flagellum, slime capsule
- B Flagellum, slime capsule, plasmid
- C Plasmid, slime capsule, flagellum
- D Slime capsule, plasmid, flagellum

1.1.9 A seed bank in Norway stores seeds of a rare and endangered plant. To ensure that seeds stored are conserved, 120 seeds of this plant were selected to be grown. Out of these 120 seeds only 90 germinated.

What percentage of the seeds did not germinate?

- A 50%
- B 25%
- C 50%
- D 75%

1.1.10 Phylum with a closed blood system and a through-gut is the...

- A arthropoda
- B cnidaria
- C annelida
- D porifera

(10 x 2) (20)

- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.10) in the ANSWER BOOK.
- 1.2.1 Photosynthetic tissues in the leaf consisting of elongated cells
  - 1.2.2 Part of a flower that becomes a fruit after fertilisation
  - 1.2.3 An evolutionary trend in the animal kingdom towards centralisation of the central system concentrating it in the anterior region of the body
  - 1.2.4 The type of reproduction that does not involve the fusion of gametes
  - 1.2.5 Medication taken for the treatment of bacterial diseases
  - 1.2.6 The ability of an organism to produce antibodies to fight diseases
  - 1.2.7 Molecules that act as energy carriers
  - 1.2.8 A structure made to cultivate plants where the roof and walls are made with transparent glass or plastic
  - 1.2.9 A cartilaginous structure which prevents food from entering the trachea
  - 1.1.10 Animals that remain attached to a substrate for most of their lives

(1x10) (10)

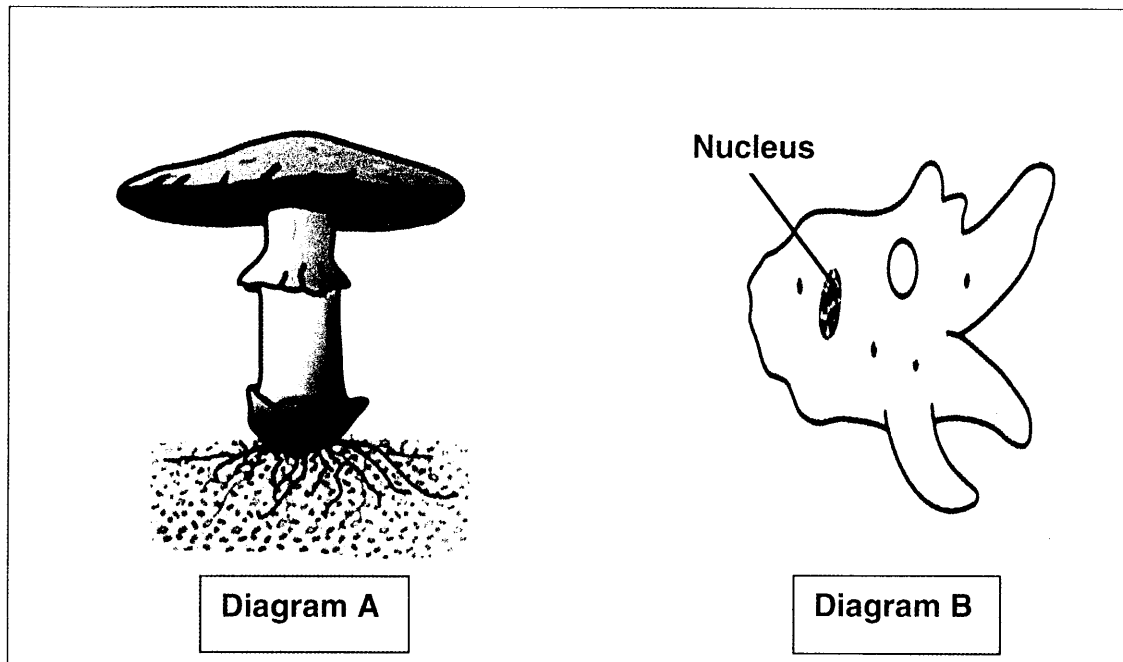
- 1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.5) in the ANSWER BOOK.

COLUMN I		COLUMN II
1.3.1	Gland that function as both exocrine and endocrine	A: Liver B: Pancreas
1.3.2	A plant body that has not differentiated into true roots, stems and leaves	A: Thallus B: Sorus
1.3.3	The site for cellular respiration	A: Chloroplast B: Mitochondria
1.3.4	Plants with naked seeds	A: Pteridophytes B Bryophytes
1.3.5	A fluid filled body cavity	A: Gut B: Coelom

(5 x 2)

(10)

1.4 Study the diagrams below.



- 1.4.1 Name the Kingdom represented by each of the following
- (a) Organism **A** (1)
- (b) Organism **B** (1)
- 1.4.2 State TWO characteristic features of the kingdom represented by organism **A**. (2)
- 1.4.3 The kingdom to which organism **A** belong is valuable to the environment.
- (a) Mention ONE medicinal value (1)
- (b) Mention ONE other industrial/ economic value (1)
- 1.4.4 Malaria is a disease caused by organisms that belong to kingdom **B**.
- State TWO symptoms of malaria. (2)
- 1.4.5 Explain ONE way how the group of organisms represented by diagram **B** play a role in maintaining balance in the environment. (2)

**(10)**

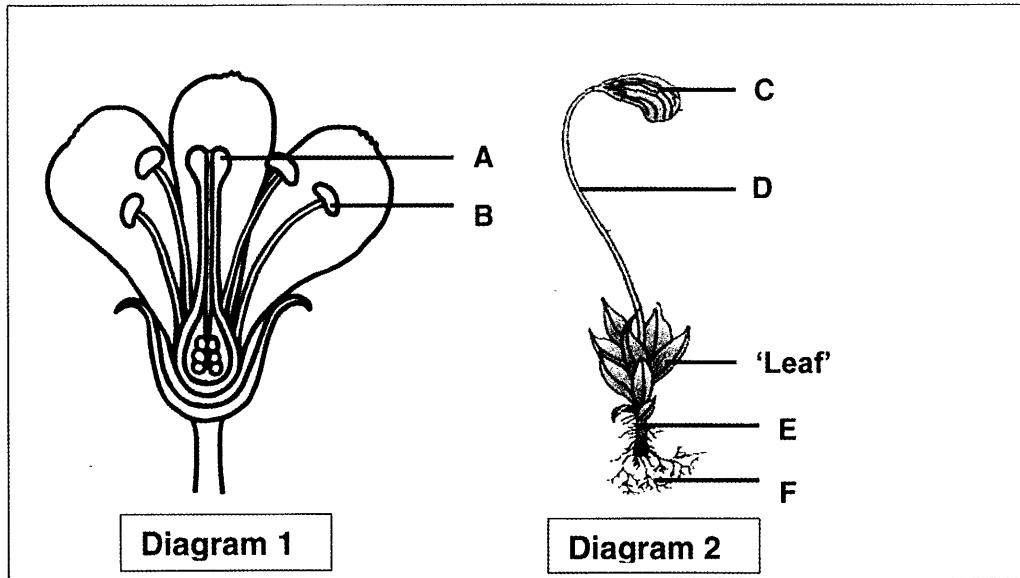
**TOTAL SECTION A: 50**



**SECTION B**

**QUESTION 2**

2.1 The diagrams below represents plant diversity



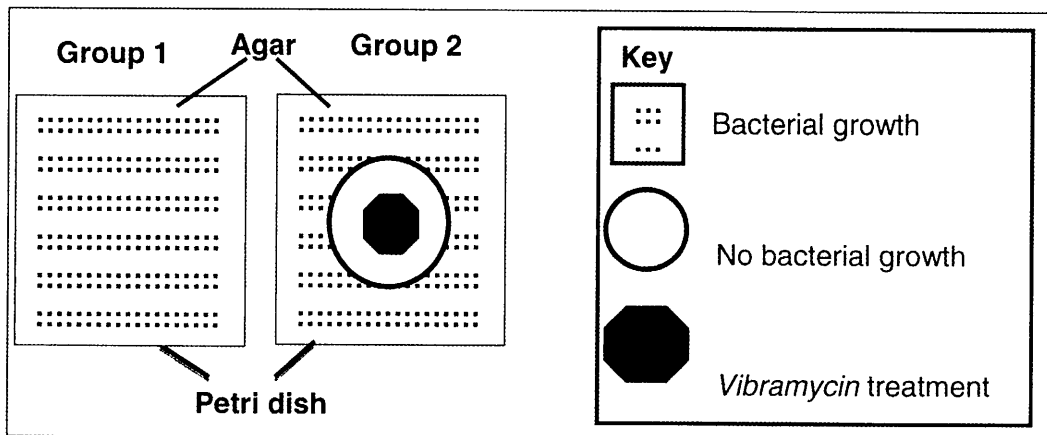
- 2.1.1 State the function of:
- (a) Part **A** (1)
  - (b) Part **B** (1)
- 2.1.2 Give TWO observable reasons why **diagram 1** represents an insect pollinated flower. (2)
- 2.1.3 Name the dominant generation in plant group represented by:
- (a) Diagram **1** (1)
  - (b) Diagram **2** (1)
- 2.1.4 Identify part:
- (a) **D** (1)
  - (b) **E** (1)
  - (c) **F** (1)
- 2.1.5 Give TWO reasons why the plant represented by **diagram 2** is poorly developed to live on land (2)

**(11)**

2.2 Grade 11 learners wanted to investigate whether a new antibiotic, called *Vibramycin*, could restrict the production of a population of bacteria which was resistant to other antibiotics.

Their investigation was set up as follows:

- The bacteria were cultured in the same type of agar medium in 20 petri dishes of the same size and then divided into 2 groups:
  - **Group 1:** 10 petri dishes were given no treatment
  - **Group 2:** 10 petri dishes were treated with *Vibramycin* of the same concentration
- The petri dishes were then incubated under the same conditions and examined for bacterial growth.
- The diameter of the area where no bacteria grew was measured for each petri dish.



2.2.1 For the investigation above identify:

- (a) The dependent variable (1)
- (b) THREE factors that should have been kept constant during the investigation, other than those mentioned above. (3)

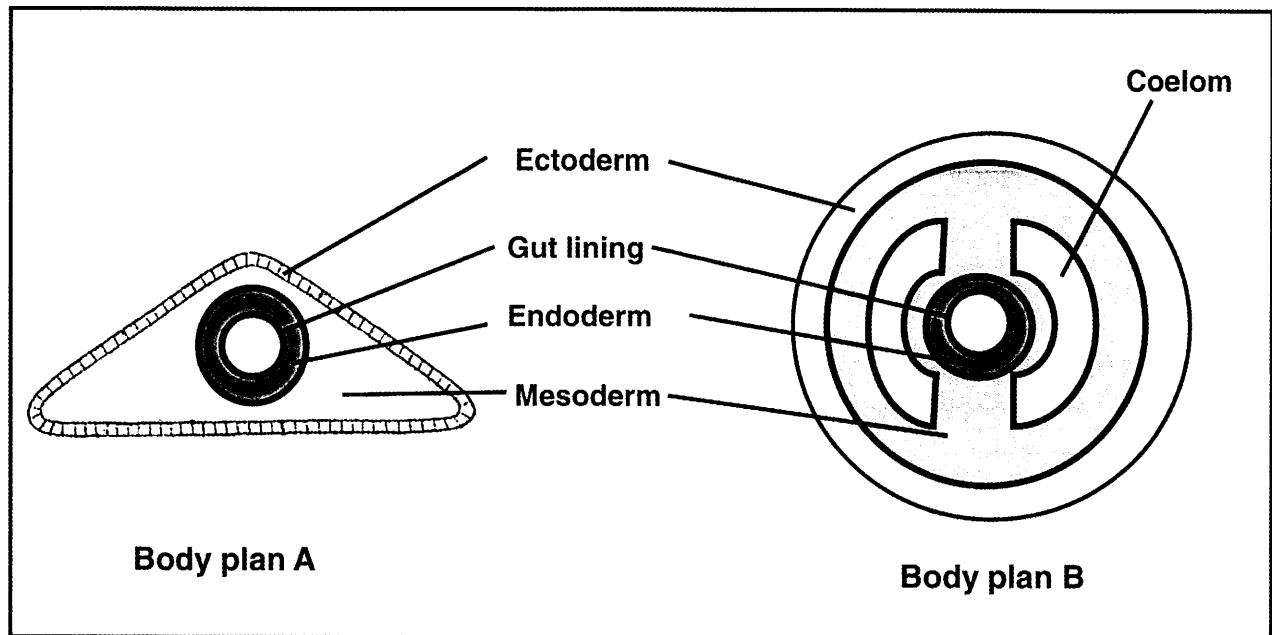
2.2.2 Why did the scientist use more than one petri dish in each group? (1)

2.2.3 What was the aim of group 1 in the investigation? (1)

2.2.4 A similar experiment was done in which the cultured bacteria were divided into 5 groups. These groups were then treated with different concentrations of *Vibramycin*.

- (a) Formulate a hypothesis for the above investigation. (2)
  - (b) State the independent variable for this investigation. (1)
- (9)**

2.3 Study the diagrams below showing body plans of two organisms.



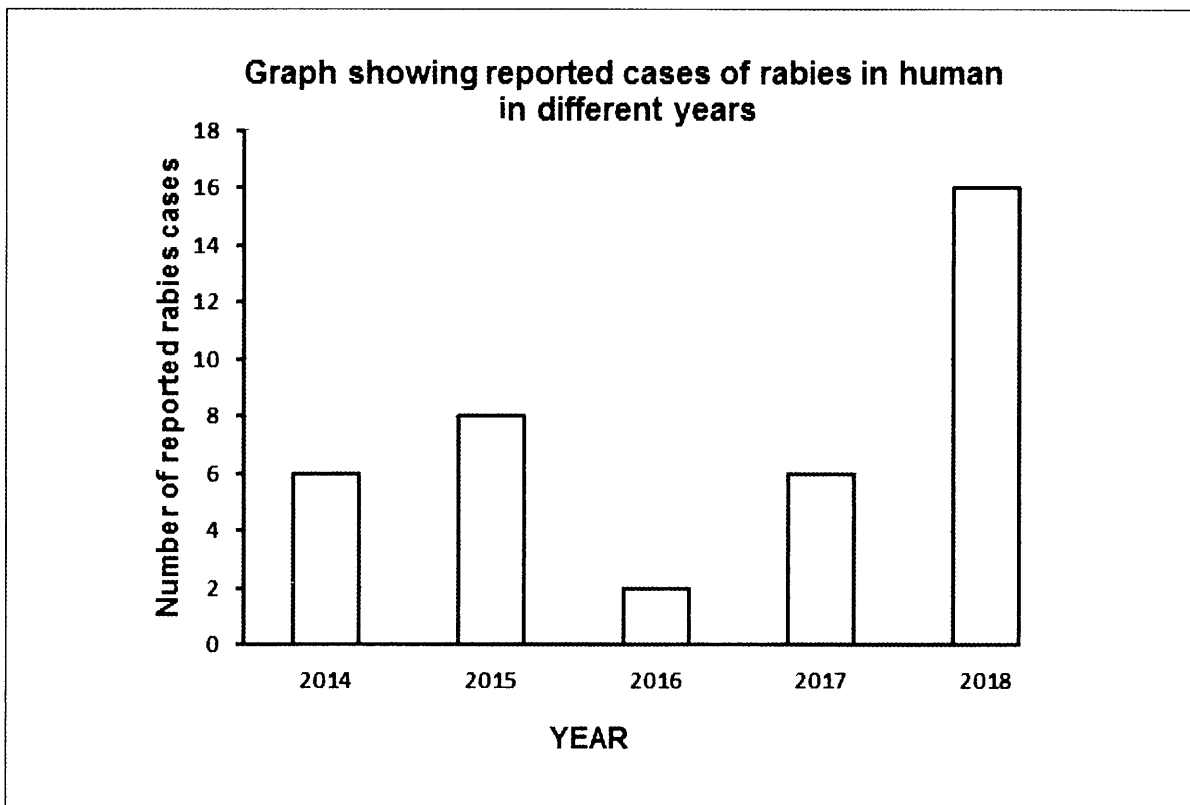
- 2.3.1 Are the body plans shown in the diagrams diploblastic or triploblastic? (1)
- 2.3.2 Give a reason for your answer in **QUESTION 2.3.1**. (1)
- 2.3.3 State the type of symmetry characteristic of organism with body plan **A**. (1)
- 2.3.4 State TWO animal phyla that you have studied, that display body plan **B**. (2)
- 2.3.5 From which embryonic layer does the gut lining develop? (1)
- 2.3.6. The presence of a coelom in body plan **B** allows for the formation of a more specialised animal than body plan **A**.  
Explain TWO reasons for the above statement. (4)
- (10)**

2.4 A skeletal system is necessary for all living organisms. The type of skeleton enables different organisms to adapt to their unique environments and to ensure their survival.

2.4.1 Name the type of skeleton in arthropods. (1)

2.4.2 Name TWO other skeletons that you studied (2)  
(3)

2.5 Study the graph below showing the number of reported rabies cases in human in different years and answer the questions that follow.



2.5.1 In which year was the highest number of rabies cases reported? (1)

2.5.2 Calculate the percentage increase in reported cases between 2014 and 2016. Show all working. (2)

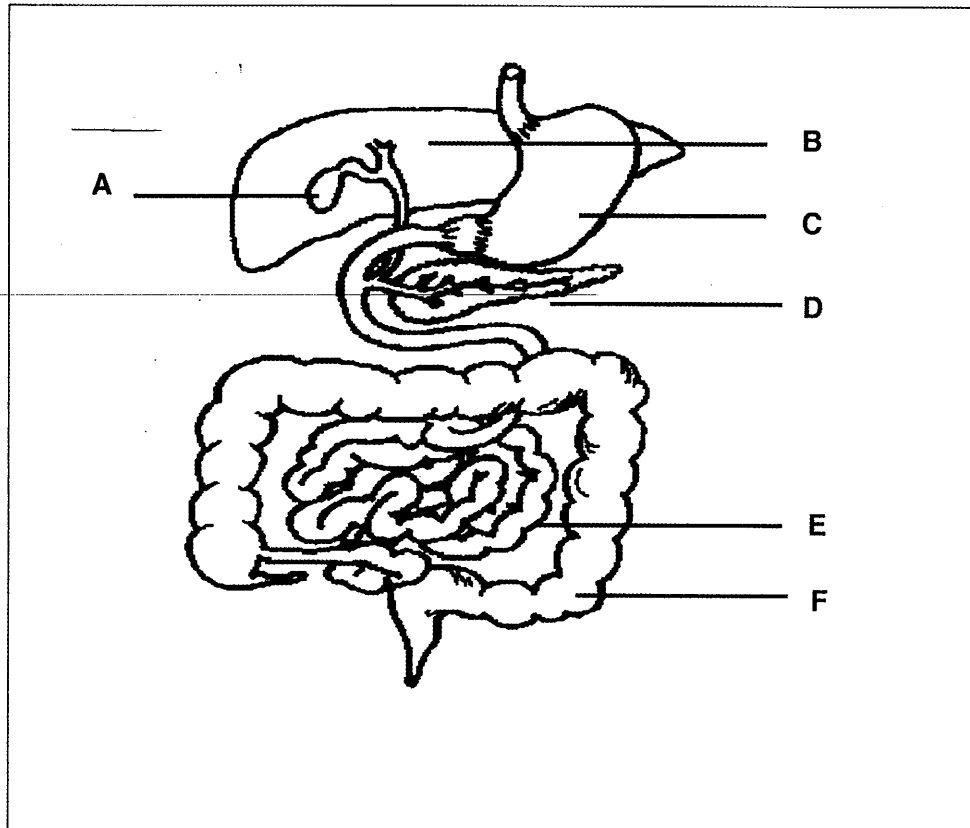
2.5.3 Describe the trend shown by the data on the reported cases of rabies. (3)

2.5.4 Between which two consecutive years was the greatest increase in reported cases? (1)

(7)  
[40]

**QUESTION 3**

3.1 Study the diagram below showing part of the human digestive system and answer the questions that follow.



- 3.1.1 Identify parts **A**, **C**, **E** and **F** (4)
- 3.1.2 Explain ONE structural adaptation of the oesophagus for its function. (2)
- 3.1.3 Name the disease related to a high blood sugar level. (1)
- 3.1.4 Describe the role of part **B** and **D** when the blood glucose level decreases below normal. (5)
- (12)

3.2 The table below shows the effect of temperature on the rate of photosynthesis in a species of plant.

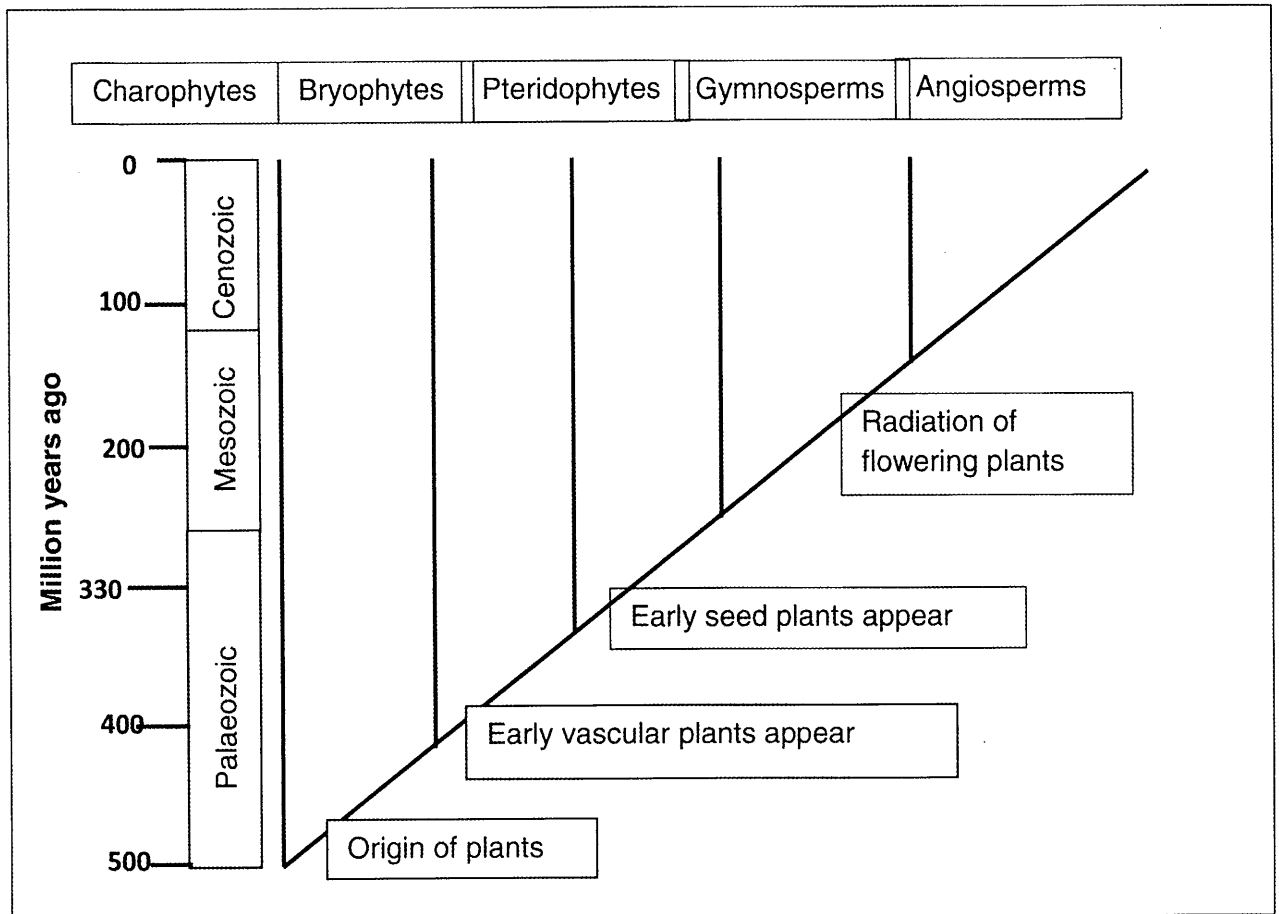
Temperature °C	Rate of photosynthesis ( arbitrary units)
15	14
20	17
25	20
30	15
35	10

3.2.1 Draw a line graph to represent the data in the table. (6)

3.2.2 Why is the rate of photosynthesis low at a temperature of 15°C (1)

3.2.3 Explain TWO reasons why an increase in carbon dioxide concentration may not necessarily lead to an increase in the process of photosynthesis. (4)  
**(11)**

3.3 Study the information below and answer the questions that follow.



- 3.3.1 What is the name given to the above diagram? (1)
  - 3.3.2 In which era did the bryophytes first appear? (1)
  - 3.3.3 Identify ONE characteristic from the diagram that is shared by pteridophytes but is absent in bryophytes. (1)
  - 3.3.4 According to the diagram, what characteristic is shared by the gymnosperms and angiosperms only? (1)
  - 3.3.5 Are bryophytes or pteridophytes more closely related to angiosperms? (1)
  - 3.3.6 Give a reason for your answer in QUESTION 3.3.5 (2)
  - 3.3.7 State TWO advantages of storing seeds in seed banks. (2)
- (9)**

3.4 Read the extract below and then answer the questions that follow

**The need for oxygen supply**

Cellular respiration is the process in which cells use oxygen to produce ATP. During exercise muscles cells have to work harder which increases their demand for oxygen and thus breathing and heart rate increases to help increase the oxygen in the blood stream. During high speed athletics the oxygen supply is less than the demand therefore muscles begin converting glucose into lactic acid instead of energy. At the end of the race, athletes have to breathe deeper and faster.

- 3.4.1 Name the type of respiration that requires no oxygen. (1)
- 3.4.2 An athlete runs very fast for 200m. When he stops running, his breathing rate and his heart rate remain high for several minutes.  
 Explain why his breathing rate and heart rate remain high. (2)
- 3.4.3 Tabulate TWO differences between aerobic and anaerobic respiration. (5)
- (8)**  
**[40]**

**TOTAL SECTION B: 80**



**SECTION C**

**QUESTION 4**

Describe the events during the dark phase of photosynthesis in plants and also describe steps to follow when testing a green leaf for the presence of the stored products of this process. Explain how carbohydrates are broken down in the human digestive system.

Content : (17)  
          (3)  
Synthesis: (20)

**NOTE:** NO marks will be awarded for answers in the form of tables, flow charts or diagrams.

**TOTAL SECTION C: 20**

**GRAND TOTAL: 150**